

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Richard P. McClellan, et al.

Serial No.: 09/655,477

Group Art Unit: 2876

Filed: September 05, 2000

Examiner: April A. Nowlin

For: **BOX DETECTOR IN BARCODE
ENVIRONMENT**APPENDIX TO BRIEF
CLAIMS 6-9

Hon. Commissioner of Patents January 29, 2003

Washington D.C. 20231 Los Angeles, CA 90024

6. In a system where cardboard boxes are moved in a predetermined largely horizontal first direction along a defined box path and the boxes contain barcodes that move along a barcode path that is parallel to said box path and the barcodes have vertically elongated bars and spaces, where the boxes are to be detected and the barcodes are to be read, where the system includes a barcode reader that reads a detected barcode, a largely horizontally scanning laser beam source that directs a scanning laser beam at the barcode path, and a laser reflection sensor that detects reflections of the laser beam by producing sensor signals whose magnitude is largely proportionate to the intensity of detected light,

of apparatus for detecting each container, comprising:

a cardboard box detecting circuit having an input connected to said laser reflection sensor to receive said sensor signals;

said box detecting circuit is constructed to generate a "box-detected" signal indicating detection of a box when the magnitude of the output from said laser reflection sensor increases from a lower level representing no box to above a predetermined level which represents reflections from a box, with said container detecting circuit having a circuit part that ignores an increase in reflectance from a barcode space element or other highly reflective surface that follows a brief decrease from an adjacent barcode bar element or other similarly thin low reflective marking on the box.

7. The system described in claim 6 including:

a data storage device that stores data representing the output of said laser reflection sensor;

said box detecting circuit is constructed to generate a signal indicating detection of a box after it detects an output from said laser reflection sensor that has a magnitude that increases from a low level representing no box to above a predetermined box-present level which represents reflections from a box, and with the magnitude remaining above said box-present level for at least a predetermined time representing box movement of a plurality of centimeters representing a container of minimum length, with any drops in magnitude lasting no more than a predetermined period representing barcode elements, being ignored.

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8. A system for use with box-like containers generally having flat front vertical surfaces and containing barcodes with vertically elongated low reflective bars and higher reflectance spaces, that move sequentially along a primarily horizontal path with a minimum space between containers, for detecting the containers as well as reading the barcodes, comprising:

a scanning laser source positioned to direct a horizontally scanning laser beam at said path in a direction largely perpendicular to said front vertical surfaces;

a laser reflection sensor positioned to detect reflections of said scanning laser beam;

a barcode reader connected to said sensor to detect and read barcodes scanned by said laser beam;

container detecting means connected to said sensor to which said barcode reader is connected, for generating signals indicating detection of a container, said detecting means constructed to detect the high reflectance of said container than a space between containers, and to not mistake a bar of a barcode for a space between containers by the small horizontal length of the barcode compared to said minimum space between subsequent containers.

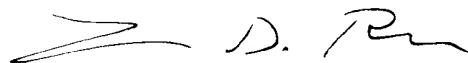
9. A method for use with a system that includes a transport for moving boxes with forwardly-facing vertical surfaces and with barcodes thereon having vertically elongated regular bar and space elements, along a predetermined largely horizontal path, a scanning laser beam source that directs a scanning laser beam at the path of the barcodes, a laser reflection sensor that produces an

reader connected to said sensor, where the method can detect the leading and trailing ends of each box container whether or not it has a barcode, comprising:

detecting the passage of the leading end of a container by detection of an increase in magnitude of output from said laser reflection sensor, from a low magnitude representing noise when no container is present in the path of the laser beam, to at least a predetermined higher magnitude representing reflections from an unmarked surface of a container, and the maintenance of such predetermined higher magnitude for longer than a predetermined period of time;

detecting the passage of a trailing end of a container by detecting a decrease in magnitude of output from said laser reflection sensor, from above to below said predetermined higher magnitude and the maintenance of such magnitude of output below said predetermined higher magnitude for longer than at least the period during which one of said bar elements is detected.

Respectfully submitted,



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